

REMARKS

Reconsideration and allowance of this application are respectfully requested in light of the foregoing amendments and the following remarks.

Claim Status

Claims 1-14 were originally presented in this application. Claims 2 and 10 have been canceled. Claims 1, 3, 7, 8, 10, and 14 have been previously amended. Claims 15-18 were previously added. Claims 19, 20, 21 and 22 have been added and are identical to original claims 1, 7, 8, and 14 respectively, thus, no new matter has been added. Accordingly, there are 20 currently pending claims in this application, claims 1, 3-8, and 10-22.

s103 Rejection

Claims 1, 3-8 and 10-18 are rejected as being obvious in view of Cho (USPN 6616841). Applicant respectfully disagrees. Applicant contends that Cho does not teach or suggest the instant invention and, furthermore, Cho is nonanalogous art.

Independent claims 1, 7, 8 and 14 teach a membrane contactor/system where the membrane contactor comprises, among other things: a first tube sheet and a second tube sheet affixing said fabric to said center tube at each end of said center tube ends, a plug located at said first tube sheet, said fiber lumens

being open at the first tube sheet and said hollow fiber lumens being closed at the second tube sheet, said first end cap and said first tube sheet defining a first head space therebetween; said first end cap having an opening therethrough, wherein said first end cap opening being in communication with hollow fiber lumens via first head space; said second end cap having an opening, and said second end cap opening being in communication with said center tube.

This configuration of a membrane contactor is nonobvious in view of Cho because Cho does not teach or suggest the instant invention. All claim limitations must be taught or suggested.

MPEP § 2143.03.

The Examiner stated that Cho teaches, as shown in Figure 4, where the membrane lumen is open only on one end, "but is not the same end as claimed, but eliminates the 'first' end cap in the reference in Figure 4." The Examiner further stated that "this difference in the claims is only an obvious equivalent of the teaching of the reference unless applicant can show otherwise, with evidence." Applicant submits the attached 132 Declaration by one of the named inventors, Amitava Sengupta, as evidence that this is not an obvious equivalent.

Although Cho shows a membrane contactor in Figure 4 where the center tube is plugged at one end and opened at the other, Cho does not show a membrane contactor, as in the instant application, where the center tube is plugged at the same end that the hollow fiber lumens are open and that the center tube is open at the end where the hollow fiber lumens are closed. As shown in the Sengupta Declaration, this configuration is nonobvious in view of the prior art because it resulted in an unexpected result of allowing the instant invention to be made more easily.

"Evidence of unexpected results must be weighted against evidence supporting *prima facie* obviousness in making a final determination of the obviousness of the claimed invention." *In re May*, 574 F.2d 1082, 197 USPQ 601 (CCPA 1978). Thus, in the instant invention, the Sengupta Declaration must be weighed in making a final determination of obviousness.

First, this configuration, as shown in the Sengupta Declaration, resulted in the unexpected result of allowing the membrane contactor to be made more easily because it eliminated the need to dual weld the end cap to the shell and center tube. Welding the end cap to the shell was previously done by simultaneously welding the end cap to the shell and the end cap to the center tube (see Sengupta Declaration, Paragraph 7-12). This dual welding step is very difficult to accomplish when

manufacturing a membrane contactor (see Sengupta Declaration, Paragraph 14). Thus, eliminating the dual welding step to a single weld of the shell to the end cap allows a membrane contactor to be made more easily which is an unexpected result of this configuration, making this configuration nonobvious.

Second, this configuration resulted in the unexpected result of allowing the membrane contactor to be made more easily by allowing the membrane contactor to be created where the shell, end caps, tube sheets, and center tube may be made out of the same material (see Sengupta Declaration, Paragraphs 15-16). Cho, Kuzumoto, Huang, nor Katou teach or suggest, as the Examiner has asserted, that the shell, end caps, tube sheets, and center tube must be made from the same material. Where is that suggestion? Answer, only in the instant application. Thus, eliminating the dual welding step to a single weld of the shell to the end cap allows the shell, end caps, tube sheets and center tube to be made out of the same material making this configuration nonobvious.

Therefore, Cho does not teach or suggest making a membrane contactor with the configuration of the instant application, i.e., where the center tube is plugged at the same end that the hollow fiber lumens are open and the center tube is open at the end where the hollow fiber lumens are closed. Thus, this configuration of a

membrane contactor is nonobvious because it resulted in an unexpected result; thus, claims 1, 3-8 and 10-18 should be allowed.

Furthermore, Cho is nonanalogous art to the instant application. To rely on a reference under 35 USC § 103, it must be analogous prior art. MPEP § 2141.01(a). To be analogous prior art, the reference must be "reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446 (Fed. Cir. 1992). The instant application is designed for solving the problem of welding the end cap to the shell with a single welding step. Cho is directed toward making a hollow fiber membrane contactor with a polymethyl pentene (PMP) hollow fiber. (Column 2, Lines 8-29). Cho is not directed and makes no mention of seals or welds between the end caps and the shell (see Sengupta Declaration, Paragraphs 12-13). Accordingly, why would one skilled in the art of membrane contactors look to Cho for addressing the problem solved by the instant application, i.e., welding the end cap to the shell by a single welding step? The answer is they would not, and the solution to the problem is found only in the instant application. Therefore, Cho is nonanalogous art to the instant invention.

Accordingly, this rejection must be removed and claims 1, 3-8 and 10-18 should be allowed.

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Conclusion

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In view of the foregoing, Applicant respectfully requests an early Notice of Allowance in this application.

Respectfully submitted,



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